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Conference Abstract

Towards a Museum Knowledge Graph: Measuring the Impact of Linked Open Collection Data for the *Museum für Naturkunde Berlin*

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Abstract

The Museum für Naturkunde Berlin (MfN) is an integrated research museum of the Leibniz Association. As part of the MfN Future Plan, the vast natural history collection is opened up and digitised; a digital catalogue, currently under development, will provide access to this collection comprising approximately 30 million objects from zoology, palaeontology, and mineralogy. Within this transformation process, an open knowledge infrastructure for all will be created, providing access for researchers as well as the wider public.

The Museum Knowledge Graph project aims to improve the transparency, accessibility and discoverability of the collection. In addition, it facilitates monitoring and reporting, e.g., in the context of institutional evaluations. For some years, the open knowledge base Wikidata has been used to create identifiers for different entities related to the museum and its collection. After starting with a project focussing on collection agents (von Mering et al. 2024), Wikidata is now used to provide more structured, human- and machine-readable data connected to the institution. Currently, Wikidata identifiers for people and events are integrated in our collection management system, Specify.

The evolving Museum Knowledge Graph provides information about the museum in time and space. It contains data on entities such as taxa, specimens, people, places,

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publications, and events, as well as their relationships, supporting better contextualisation of collection and research data. The collaborative and multilingual tool, Wikidata, links to external databases and their identifiers, thus serving as a central hub for Linked Open Data (LOD).

The current focus is on the following entities (Fig. 1), including:

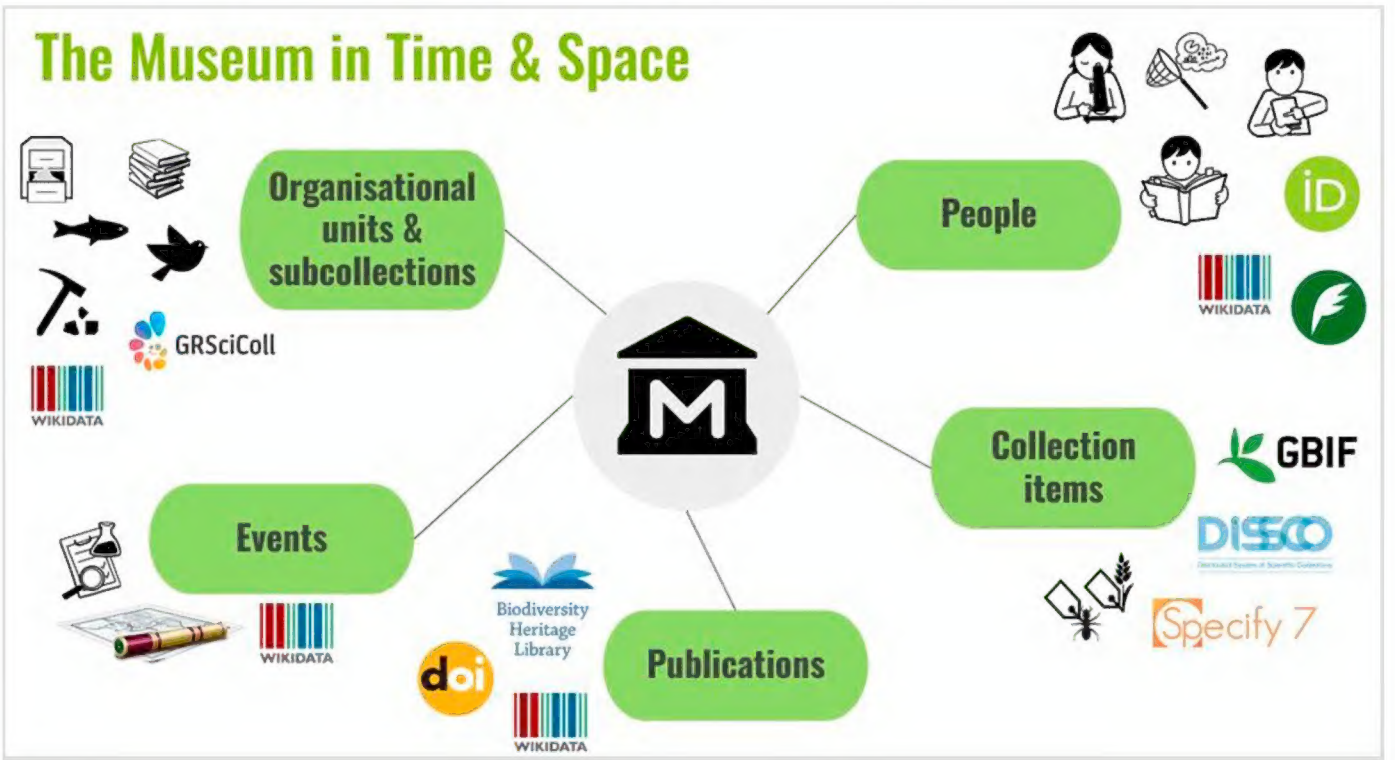

Figure 1.

The Museum in Time & Space. Main entities of the evolving Museum Knowledge Graph. Icons CC0 via Wikimedia Commons and from Kücklich (2020).

1. **People (1000+):** Collection agents with different roles working at or affiliated with the museum or contributing to the collection; well-known collectors as well as hidden figures; technical staff; and underrepresented or marginalised groups, e.g., local guides, indigenous contributors, women in natural history.
2. **Collection objects (close to 1 million):** Persistent identifiers, so-called NURIs (Naturkundemuseum URIs), are generated for MfN specimens (based on Consortium of European Taxonomic Facilities (CETAF) Stable Identifiers; Groom et al. 2017).
3. **Publications (200+):** Books or scholarly articles dealing with the collection or institutional history, e.g., accession catalogues, published catalogues of type specimens (von Mering in press), about research expeditions commissioned or organised by the museum, also publications in the MfN journals published by Pensoft.
4. **Events (20+):** Important historical events such as research expeditions (von Mering et al. 2024b), milestones in the history of the museum (e.g., new building, acquisition or moving of a collection) or conferences held at the museum.
5. **Organisational units and subcollections (20+):** Centres, departments and subcollections (also predecessor institutions) of the MfN.

Agents and expeditions are linked to estates and records in the MfN Archive, with inventory numbers and links to available finding aids that can improve access to relevant sources such as field notebooks, correspondence, diaries, etc., helping us also to uncover hidden contributors and historical contextualisation.

The dynamically growing Museum Knowledge Graph is part of work done in the Research & Innovation field, Data for Nature, which is part of the science programme, Collection Future. Currently, we are scaling up, importing data from several subcollections, including identifiers for people following disambiguation, and for research expeditions. The newly created WikiProject, MfN Berlin Names, will support keeping track of named entities related to the museum. In addition to tracking MfN-related citations of publications and specimens, we aim to measure the number of connections, the reuse of data and linked media, and thus have an additional indicator for impact. Edits and additions to newly created Wikidata items are monitored, different tools developed within the Wiki community allow the community of users to receive such metrics.

The example of the Museum für Naturkunde Berlin (Fig. 2) demonstrates the value of Wikidata for unlocking, connecting and contextualising information about natural history collections in a Museum Knowledge Graph. Contributing to the larger LOD ecosystem will help to answer interdisciplinary questions and discover unexpected connections.

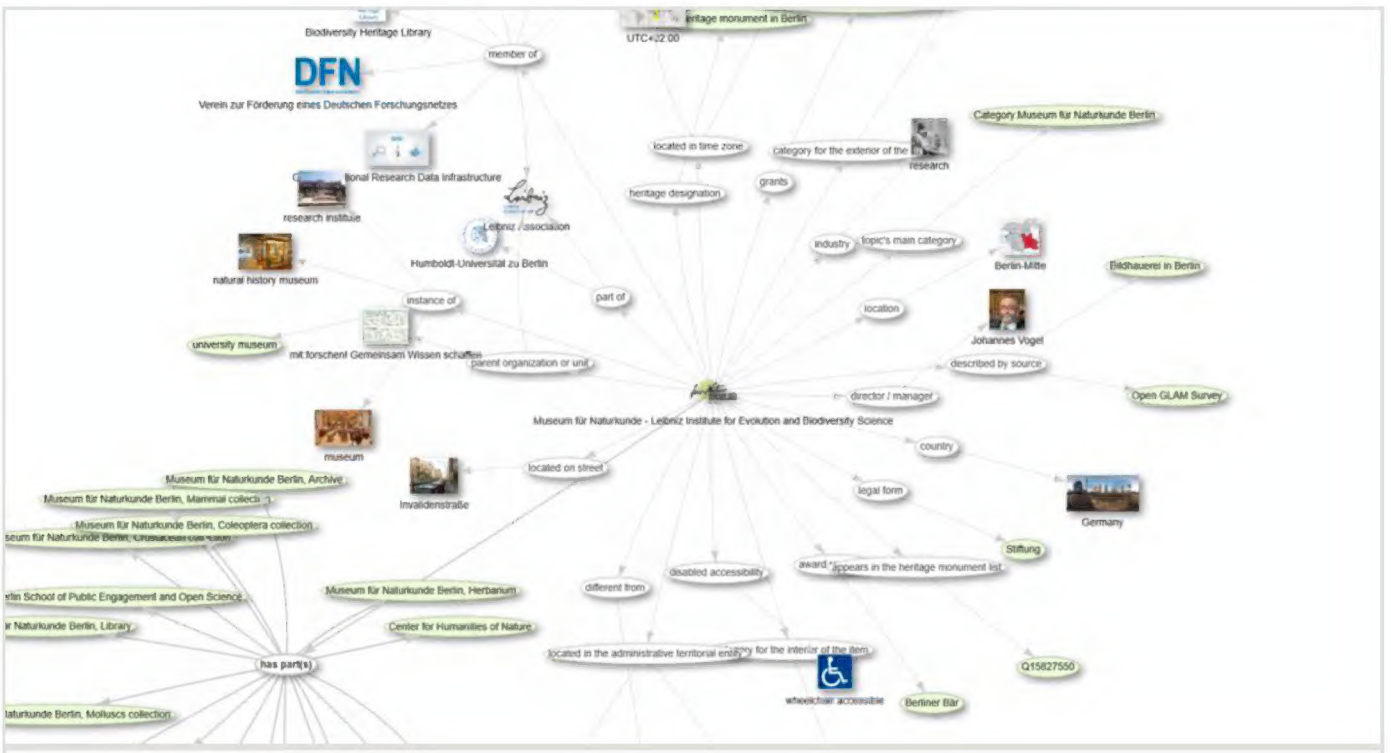

Figure 2.

Scholia visualisation of the *Museum für Naturkunde Berlin* in context; based on data from Wikidata (CC-BY-SA; Nielsen et al. 2017).

Keywords

knowledge graphs, named entities, natural history collections, natural history museums

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Conflicts of interest

The authors have declared that no competing interests exist.

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